Santonine	5 grains.
Soda, Hyposulphite of	5 do.
Tannin	5 do.
Zinc, Oxide	10 do.
Do. Sulphate (dried)	3 do.

Thus, there were, first, a number of cathartics which might be introduced into the rectum, and thus often afford relief to patients, without their being subjected to the disagreeable ordeal of swallowing some nauseous medicine. We had all known that nurses were occasionally in the habit of introducing a bit of soap into the bowels of children, with the view of inducing a motion, and the result was thus probably due to the physical irritation that ensued. But the question was, whether we could not introduce some substance into the rectum in the form of a suppository, which would exert such an action on the mucous or muscular coats of the bowel as to lead to a full evacuation. He (Prof. S.) had employed the gamboge suppository in some instances, with a satisfactory result. When introduced into a rectum which was distended with fecal matter, it almost always acted comfortably within an hour; but if introduced into an empty bowel it gave rise to severe griping. He had under his care a lady from Liverpool, who told him the other day with an air of much surprise, that her bowels had acted the night before. She had been habitually constipated, and for many years had had no relief except from the use of an enema, which she used to employ in the morning; and the evening evacuation which had so astonished her resulted from the action of a gamboge suppository which had been introduced. He was not, of course, prepared to say what the precise doses of the different drugs, when thus employed, ought to be; certainly the half-grain of elaterium noted in the list was too large a dose, and in one case had produced some dysenteric symptoms. He sometimes saw, along with Dr. Maclagan, a young lady in whom half a grain of podophyllin in a suppository acted very easily and well; but, in some other patients, the use of a podophyllin suppository had been followed by a very prolonged diarrhœa.

Again, mercury could be administered in the suppository form in cases where it was deemed necessary to salivate, for its specific action was sometimes very rapidly developed when it was thus employed. In this form, moreover, it was one of the most effectual means at our command for the destruction of ascarides; an object which in other instances might probably be attended by the use of suppositories containing santonin or hyposulphite of soda as their active ingredients.

Besides the drugs of the aperient class, we might employ others of a more sedative or tonic character. Thus the acetate-of-copper suppository had been found useful in case of bleeding piles, and he had seen a patient who was suffering from fissure of the anus, and who rebelled against the use of morphia, greatly relieved by employing suppositories containing the dried sulphate of zinc. Ergot might be administered in this manner in appropriate cases; and quinia and iron might be similarly administered—especially with patients whose stomach resented the use of chalybeates. Astringents, too, of every variety, could be employed with the greatest benefit; and, indeed, one could hardly predicate how many kinds of medicines we may yet learn usefully to administer in the form of a simple suppository.—*Edinburgh Medical Journal*, May, 1865.

10. *Basic Nitrate of Bismuth as a Disinfectant.*—This article, when applied to suppurating wounds, is said to remove all odour, and hasten the healing process. It has been employed in scrofulous sores with much success.

11. *A New Soup for Children.* By Justus Von Liebig.—For mothers, who have not the good fortune to be able to nurse their own children, or who are deficient in nourishment for their young, the choice of a food suitable for the support of the latter is an object of importance; custom and opinions differ for the most part on the subject, and as the simple laws of nutrition, which should determine this choice are, generally speaking, wholly unknown to the persons to whom the selection must be left, the bodily development of the

children is frequently impaired in earliest infancy by the mode of feeding them (see my *Chemical Letters*, Letter 30, p. 57). It is evident that a child, deprived of its mother's milk without a nurse (the choice of whom is difficult, and is often connected with dangers of another kind), can be properly nourished only when the food given to it has the same nutritive value as woman's milk.

To obtain proper ideas on this subject, it would probably be well to call to mind that milk contains two kinds of matters, which minister to different functions in the system; from the casein in the milk the principal constituent of the blood is formed, and from the latter the principal constituent of the flesh; the butter and the sugar of the milk serve various other purposes in the body, and are used, in their ultimate form, for the development of animal heat.

The food of man and that of animals have a composition similar to that of milk, in so far as they invariably consist of a mixture of two kinds of matters, of which one fulfils the same office as the casein, while the other supplies the place of the fat and of the sugar of milk; the formation of blood or flesh, and the temperature of the body being thus maintained through the food.

The seeds of the cerealia contain a substance identical with coagulated casein, the seeds of the leguminosæ, peas, and beans contain a matter identical with the cheese as it exists in milk. It is true that the flour of the cerealia contains no sugar of milk and but little fat, but it is rich in starch, which in the stomach is converted into sugar.

For the normal maintenance of the vital process the relative proportion of blood and warmth-creating matters in the food of the animal is not indifferent; in order to increase in his bodily weight, or to grow, the individual needs not only an increasing mass of food, but a varying proportion of blood and warmth-creating constituents in the food.

It is the great merit of Haubner, that he was the first to obtain practical recognition among agriculturists of the importance of the correct proportion between both classes of substances in the feeding of animals, to which I directed attention in my *Chemical Letters*, and through the admirable investigations of Henneberg, Stohmann, Lehmann, Knop, Arendt, Bähr, Pincus, and others, connected therewith, the principles of a theory of feeding have now been obtained, by which the agriculturist or the producer of meat and milk is enabled so to replace the milk in the feeding of the calf, or the hay, the universal food which nature presents to the herbivora, by the admixture of such food at his command, as turnips, oat and rye straw, potatoes, rape-cake, pea-meal, &c., that the latter produce a nutritive effect equivalent to that of milk or hay.

The investigations just alluded to have shown that if the flesh and warmth-creating nutriments, corresponding to the age and wants of the individual, are given in the correct proportion, both produce a maximum of nutritive effect.

A deficiency of warmth-creating constituents may be replaced by an excess of blood-creating matters, but this excess then loses its power to increase the weight of the body. The warmth-creating matters are incapable of producing blood; an excess beyond the proper proportion loses its efficiency.

In this it is assumed that as much food be given to the individual as he has inclination or appetite to eat.

If we suppose that a boy, for the simple maintenance of his bodily weight, needs half an ounce of blood-and-flesh-forming aliment, this will be obtained in potato diet, if the boy is able daily to consume twenty-four ounces of steamed potatoes, for the increase of his muscular substance a greater quantity must be used.

Potatoes contain for one part by weight of blood-forming substance, 9 to 10, say ten parts of warmth-producing matter (starch). In 24 ounces of steamed potatoes there are 5 ounces of starch, of which only $2\frac{1}{2}$ ounces are used in the body for the production of heat; the balance of $2\frac{1}{2}$ ounces passes off by the bowels unused.

In five ounces of peas we have one ounce of blood-forming substance (consequently as much as in 48 ounces of steamed potatoes) and $2\frac{1}{2}$ ounces of starch. It is evident that if we make a mixture of 12 ounces of steamed potatoes, and of peas-porridge prepared from $2\frac{1}{2}$ ounces of peas, we have in it:—

		Blood-forming substance.	Warmth-producing substance.
12	ounces of potatoes contain . .	0.250	2.50 ounces.
2½	" peas " . . .	0.500	1.25 "
14½	Total	0.750	3.75 ounces.

or the proportion of 1 : 5 corresponding to the wants of the body of the boy. The boy will not only more easily assimilate this mixture of 14½ ounces of peas-porridge and potatoes than the above 24 ounces of potatoes alone, which have only imperfectly nourished him, but he will also in this less weight of food appropriate one-fourth more of blood-forming aliments—an excess which is necessary for his growth—that is, to increase his bodily weight.

This example may exhibit the principles which have guided me in the preparation of a food for nurslings: as I have mentioned, they have been verified in a remarkable manner in the feeding of cattle, in the production of flesh and milk.

The composition of milk is not constant; its amount of casein, sugar-of-milk, and butter, varies with the food with which the individual is nourished. According to the analyses of Haidlen, the milk of a healthy woman contains in 100 parts 3.1 of casein, 4.3 of sugar-of-milk, and 3.1 of butter; woman's milk is in general poorer in casein than cow's milk.

If we assume that 10 parts of butter produce in the animal body the same warmth-creating effect as 24 parts of starch, and likewise 18 parts of sugar-of-milk that of 16 parts of starch, we can by the aid of these numbers compare the nutritive value of milk with that of the flour of the cerealia, if we express butter and sugar-of-milk in their equivalents of starch.

In this manner we find that there are contained :—

	Blood-forming matters.	Warmth-producing matters.
In woman's milk	1	3.8
" cow's milk, fresh	1	3
" " " skimmed	1	2.5
" wheaten meal	1	5

Woman's milk is poorer in salts than cow's milk; but it has a stronger alkaline reaction, and contains more free alkali, which *in the different sorts of milk is potash.*

It is evident that we can easily calculate a mixture of milk and flour (a milk-pap), which shall contain precisely the same proportions of blood and warmth-producing aliments as woman's milk (namely, 1 : 3.8); but this mixture could not in other respects replace woman's milk, as wheaten flour has an acid reaction, and contains much less alkali than woman's milk, and (as we must suppose), than is required for normal blood-formation. Moreover, even if starch is not unfitted for the nourishment of the child, by its conversion into sugar during the process of gastric digestion, an unnecessary labour is imposed upon the system, which the latter is spared, if we first convert the starch into the soluble forms of sugar and dextrin. This can easily be done by adding to wheaten flour a certain quantity of malt flour. If we boil milk with wheaten flour to a thick pap, and add to the latter a certain amount of malt flour, the mixture after a few minutes becomes fluid, and acquires a sweet taste.

On this conversion of the starch into sugar, and on supplementing the alkali in the milk, depends the formation of the new soup, which I shall now describe.

The skimmed cow's milk usually sold seldom contains more than 11 per cent. of solid combustible matters (4 casein, 4.5 sugar, 2.5 butter); 10 parts of cow's milk, 1 part of wheaten flour, and 1 part of malt flour, afford a mixture which possesses very nearly the nutritive value of woman's milk :—

	Blood forming constituents.	Warmth-producing constituents.
10 parts of cow's milk contain .	0.4	1.00
1 part of wheaten flour contains .	0.14	0.74
1 part of malt flour contains .	0.07	0.58
	0.61	2.32
	= 1	3.8

The malt flour contains 11 per cent. of blood-forming matter, of which, however, only seven parts enter into the soup.

As wheaten flour and malt flour contain very much less alkali than woman's milk, this must be supplied in the preparation of the soup. I have found that the addition of 7¼ grains of bicarbonata of potash, or of 3 grammes or 45 grains of a solution of carbonate of potash, containing 11 per cent. of the salt, suffices to neutralize the acid reaction of both kinds of flour.

In the preparation of the soup we proceed as follows: One part by weight (half an ounce) of wheaten meal is placed in the little vessel intended for making the soup, to this the milk is gradually added in small portions with constant stirring, the conglomeration of the meal into lumps being carefully avoided; this mixture is heated with diligent stirring to the boiling point, at which it is kept for three or four minutes, and is then removed from the fire.

One part (half an ounce) of malt flour is now weighed, carefully mixed with 45 grains of the solution of carbonate of potash just mentioned, and with two parts by weight of water, and this mixture is now added with constant stirring to the milk-pap; the vessel is then covered to avoid cooling, and is allowed to stand for half an hour.

It is advisable, after the addition of the malt flour, to place the vessel in hot, nearly boiling water, so that the mixture may the longer keep warm; it thus becomes thinner and sweeter. After this time the whole is placed once more on the fire, is allowed to boil again, and the soup is then passed through a fine wire or hair-sieve, which retains the bran of the malt flour.

Those who are acquainted with the mashing process need not be reminded that after the addition of the malt the temperature should not exceed 151° F. The above directions are so calculated that, including the time used in weighing and mixing the water with the malt flour, we have, after the addition of the latter to the hot milk-pap, a mixture of the temperature of 151° F.

The following process is simpler, and, as cooks maintain, more convenient than that just described:—

Half an ounce of wheaten meal, half an ounce of malt flour, and seven and a half grains of bicarbonate of potash, are weighed, mixed first with one another, and afterwards with an ounce of water, and lastly with five ounces of milk; the mixture is then heated with constant stirring, over a very gentle fire, until it begins to grow thickish; the vessel is now removed from the fire, and its contents are stirred for five minutes; these are then heated once more and again removed, when a new thickening occurs; lastly, the whole is brought to a boil. After the separation of the bran from the milk through a fine sieve the soup is ready for use.

Wheaten Meal.—For this ordinary new meal is chosen, not the finest or the first shot meal, which is richer in starch than the whole meal.

Malt.—Barley malt can easily be procured from any brewer. In Germany, or rather in Munich, the malt is so much dried that the starch of many grains appears to be half-roasted. This malt employed in making the soup gives to the latter a taste of bread, which is not unpleasant; usually the malt contains an admixture of many seeds of weeds, which must be picked out with the hand. An ordinary coffee-mill answers for preparing the malt flour, the latter must likewise be separated by means of a hair-sieve, not too fine, from the chaff. Malt prepared from barley is to be preferred to that from oats, wheat, or rye.

Carbonate of Potash.—For the preparation of the solution the ordinary kali salt, carbonas depurata of the pharmacies, answers very well; two ounces of the salt are dissolved in sixteen of water. If spring water be used, there is generally a precipitate of some carbonate of lime; after an hour the fluid becomes quite clear and bright. The carbonate of potash must not be greasy or damp. The bicarbonate of potash is the ordinary crystallized salt.

Note.—In order to avoid the rather troublesome weighing of the flour, we may observe that a heaped tablespoonful of wheaten meal weighs nearly exactly half an ounce; a heaped tablespoonful of malt flour, wiped off at one-half with a card, likewise weighs half an ounce.

For measuring the solution of potash an ordinary thimble answers; this when

filled holds nearly three grammes (45 grains, 2.8 cubic centimetres) of the solution of potash.

For the milk and the water two ounces are weighed in an ordinary tumbler, then five ounces of water, and the heights at which both quantities of fluid stand are marked on the outside of the glass by attaching pieces of paper.

When the soup is properly prepared it is sweet as milk, and the further addition of sugar is unnecessary; it possesses double the concentration of woman's milk, and can, which is not unimportant for sucklings, be given in the nursing bottle. If it has been heated to the boiling point, it keeps good for twenty-four hours; if this has not been done it turns sour and coagulates like milk; if the addition of potash be neglected, it cannot, in general, be heated to the boiling point without coagulating. In the absence of the potash the soup is difficult of digestion like ordinary milk-pap.

I was first led to prepare this soup by the facts that one of my grandchildren could not be nursed by its mother, and that a second needed a more concentrated food in addition to its mother's milk; the fathers of both children are physicians, who are well able to judge of the effects of the soup. It has proved both in my own family and in other families where it has been introduced, to be an excellent food, and I myself often use it; in coffee it supplies the place of tolerably good cream.

The soup has a slightly mealy or malty taste, to which children soon become so accustomed that they prefer this food to any other. A physician of this place, Dr. Vogel, who has an extensive practice among children, tried to introduce this soup into the families of poor people; in general it did not find acceptance with them, because the thick milk-pap lost its consistence on the addition of the malt, and became thin. The people imagined that its nutritious quality was connected with the thickness of the pap, and was diminished by the malt.—*Medical Press*, May 17, 1865, from *Annalen der Chemie und Pharmacie*.

[We have used this children's food, prepared according to the directions of Prof. Liebig, and have found it to be a most light, easily digestible, and nutritious article of food.]

MEDICAL PATHOLOGY AND THERAPEUTICS, AND PRACTICAL MEDICINE.

12. *On the Cerebro-Spinal Symptoms and Lesions of Typhus Fever, and on the Relations of Typhus to Epidemic Cerebro-Spinal Symptoms.*—Dr. Charles Murchison, the physician to the London Fever Hospital, whose great experience in various forms of fever, and acknowledged acumen and mature judgment, entitle his opinions to respectful consideration, has presented (*Lancet*, April 22, 1865) the following as the conclusion at which he has arrived in regard to the identity of typhus fever and cerebro-spinal meningitis.

"It is well known," he says, "that among the phenomena of typhus the cerebro-spinal symptoms hold a very prominent place. First, there is headache with vertigo and injected conjunctivæ; then come restlessness, sleeplessness, and delirium, followed by stupor or coma. With these symptoms may be associated paralysis of the sphincters or of the detrusor muscle of the bladder, hyperæsthesia, tremors, floccitatio, subsultus or general convulsions, strabismus, tetanic rigidity of the muscles of the limbs, or even opisthotonos. Occasionally typhus commences with violent delirium and other cerebral symptoms, so that more than once I have known it mistaken for acute mania. The disease, in fact, is the *typhus comatosus* of Sauvages—the *brain fever* of many practitioners. Similar symptoms are sometimes, though more rarely, met with in the course of enteric fever, and have lately been made the subject of a separate monograph by Dr. Fritz.[1]

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[1] Étude Clinique sur divers Symptômes Spinaux observés dans la Fièvre Typhoïde. Paris, 1864.